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This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

**Claim 1 (Previously Presented):** A method for modeling a semiconductor device comprising the steps of :

(a) modeling the semiconductor device with a semiphysical model at a predetermined temperature; and

(b) incorporating the thermal properties of the material system of the semiconductor device into the semiphysical model to form a temperature dependent semiphysical .

**Claim 2 (Original).** The method as recited in claim 1, further including step (d) determining the internal charge/electric field structure of the semiconductor device.

**Claim 3 (Original).** The method as recited in claim 1, wherein said semi-physical model is configured to replicate measured direct current (DC) current-voltage (I-V) characteristics.

**Claim 4 (Original).** The method as recited in claim 3, wherein said semi-physical model is also configured to replicate bias dependent small signal characteristics.

**Claim 5 (Original).** The method as recited in claim 4, wherein said semi-physical model is configured to replicate said DC I-V and bias dependent.

**Claim 6 (Original).** The method as recited in claim 1, wherein step (b) includes the step (e): measuring the DC-IV characteristics and the S-parameter small signal parameters across a predetermined range of temperatures.

**Claim 7 (Original).** The method as recited in claim 6, further including the step (f): extracting small signal equivalent circuit models for each S-parameter measurement as a function of temperature.

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Claim 8 (Original). The method as recited in claim 7, further including step (g): developing temperature co-efficient which adjust the semi-physical device model to match the measured DC and S-parameter measurements at each temperature.

Claim 9 (Original). The method as recited in claim 1, wherein step (c) includes step (h): substituting the environment temperature that operates in any temperature dependent terms and temperature co-efficient with the channel temperature of the device.

Claim 10 (Currently Amended). The method as recited in claim (a) 1, wherein step (e) further includes step (i): the step of using of the saturated region as the length of the heat generating region.

Claim 11 (Previously Presented) The method as recited in claim 1, wherein step (b) comprises: developing temperature co-efficient expressions and adjusting the predictions of the semiphysical model to match the measured DC and small signal data at a plurality of temperatures.